CHAPTER 1
INTRODUCTION

The 8255 I/O card is a programmable peripheral interface for PC/XT, PC/AT, 80386, 80486 or compatible. The interface card contains 8253 chips and 8255 chips, the 8253 chip provides programmable interval timer/counter functions and the 8255 chips provide programmable input/output functions.

The features of the 8255 I/O card are:

*Programmable I/O control functions.
*Up to 48 I/O lines.
*Maximum of 2MHZ count rate.
*Three independent 16 bits counter.
*Support several operating modes, which are Programmable.
*Sixteen LED indicate when I/O is operating.
*Port address selectable.

PACKAGE CONTENTS:

*8255/8253 I/O card.
*8255/8253 user's manual.
*8255/8253terminator board (option).
*Two expansion flat cables (option).

CHAPTER 2

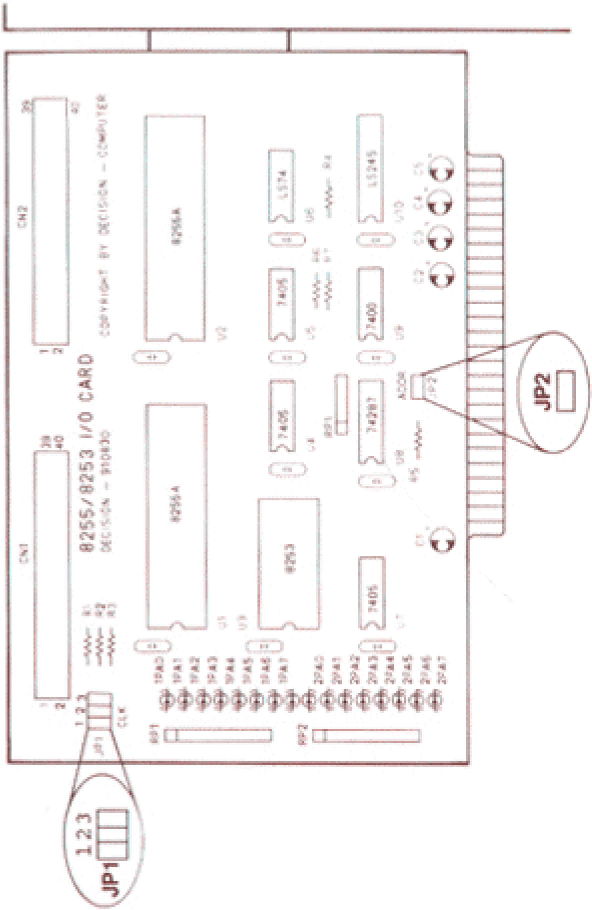
HARDWARE CONFIGURATION

2.1 Configuration for DIP Switch

Before you use the 8255 I/O card, you must ensure that the I/O address and the clock are set correctly. Observe the figure below the proper settings for the 8255 I/O card are described in the following:

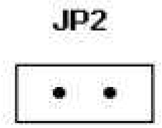
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1. I/O address

JP2: Short (default)



Select &H300 - &H30F as I/O port address. The I/O address correspond to three 8 bits ports and three counters are:

&H300: Port 1A input/output buffer.

&H301: Port 1B input/output buffer.

&H302: Port 1C input/output buffer.

&H303: Port 1 control register.

&H304: Port 2A input/output buffer.

&H305: Port 2B input/output buffer.

&H306: Port 2C input/output buffer.

&H307: Port 2 control register.

&H308: Counter 0 input/output buffer.

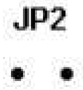
&H309: Counter 1 input/output buffer.

&H30A: Counter 2 input/output buffer.

&H30B: Counter control register

I/O address

JP2: Open



Select &H360 - &H36F as I/O port address. The I/O address correspond to three 8 bits ports and three counters are:

&H360: Port 1A input/output buffer.

&H361: Port 1B input/output buffer.

&H362: Port 1C input/output buffer.

&H363: Port 1 control register.

&H364: Port 2A input/output buffer.

&H365: Port 2B input/output buffer.

&H366: Port 2C input/output buffer.

&H367: Port 2 control register.

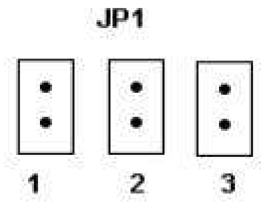
&H368: Counter 0 input/output buffer.

&H369: Counter 1 input/output buffer.

&H36A: Counter 2 input/output buffer.

&H36B: Counter control register.

2. Clock Selection



JP1-1 = Short (default) :

Select internal clock to counter 0.

JP1-2 = Short (default):

Select internal clock to counter 1.

JP1-3 = Short (default):

Select internal clock to counter 2.

JP1-1 = Open:

Select external clock to counter 0.

JP1-2 = Open:

Select external clock to counter 1.

JP1-3 = Open:

Select external clock to counter 2.

2.2 Hardware Installation

Your 8255 I/O card is design to be inserted in any available slot in your PC/XT or compatibles. In order to gain access to the expansion slots and the program switches on the main board, follow the steps listed below:

1. Set the 8255 I/O card switch.
2. Turn off all power of your computer and all peripheral devices before installing your 8255 I/O card.
3. Remove the cover of the computer.
4. Insert your pre-configured card into any available slot. Make sure your I/O card is firmly seated in the chosen slot.
5. Replace the cover of the computer.
6. You are now ready to use your 8255 I/O card for several Applications.

2.3 Pin Assignment

Port 1

PIN	1	GND	PIN	2	GND
	3	GND		4	PA3
	5	PA1		6	PA2
	7	CLKO		8	PA0
	9	GATEO		10	OUTO
	- - - - - - -	- - - - - - -		- - - - - - -	- - - - - - -
	11	OUT2		12	CLK2
	13	CLK1		14	GATE2
	14	OUT1		16	GATE1
	17	PA5		18	PA4
	19	PA7		20	PA6
	- - - - - - -	- - - - - - -		- - - - - - -	- - - - - - -
	21	PC6		22	PC7
	23	PC4		24	PC5
	25	PC1		26	PC0
	27	PB7		28	PC2
	29	PB6		30	PC3
	- - - - - - -	- - - - - - -		- - - - - - -	- - - - - - -
	31	PB5		32	PB0
	33	PB4		34	PB1
	35	PB3		36	PB2
	37	+5V		38	-5V
	39	+12v		40	-12V
	- - - - - - -	- - - - - - -		- - - - - - -	- - - - - - -

Pin Assignment

Port 2

PIN	1	GND	PIN	2	GND
	3	GND		4	GND
	5	GND		6	GND
	7	GND		8	GND
	9	GND		10	GND
	11	GND		12	GND
	13	PA0		14	PA1
	15	PA2		16	PA3
	17	PA4		18	PA5
	19	PA6		20	PA7
	21	PC7		22	PC6
	23	PC5		24	PC4
	25	PC0		26	PC1
	27	PC2		28	PB7
	29	PC3		30	PB6
	31	PB0		32	PB5
	33	PB1		34	PB4
	35	PB2		36	PB3
	37	+5V		38	-5V
	39	+12V		40	-12V

CHAPTER 3
DIAGNOSTIC

1. BASIC version

```
100 REM 8255 I/O CARD TESTI
101 NG PROGRAM
110 SCREEN 0,0,0: WIDTH 80,25: KEY OFF: CLS
120 LOCATE 10,10: PRINT "8255 I/O CARD TESTING"
130 LOCATE 12,10: PRINT "TWO 8255 PORT A,B,C OUTPUT SQUARE WAVE"
140 LOCATE 14,10: PRINT "8253 COUNTER 0 DIVIDE BY 2"
150 LOCATE 16,10: PRINT " COUNTER 1 DIVIDE BY 50"
160 LOCATE 18,10: PRINT " COUNTER 2 DIVIDE BY 100"
250 REM 8253 TESTING
255 PORT = &H300
260 OUT PORT+11,&H36
270 OUT PORT+11,&H76
280 OUT PORT+11,&HB6
290 OUT PORT+8,&H2: OUT PORT+8,&H0
300 OUT PORT+9,&H32: OUT PORT+9,&H0
310 OUT PORT+10,&H64: OUT PORT+10,&H0
320 PORT=&H300
330 OUT PORT+3,&H80
340 A=0: GOSUB 500
345 FOR K= 0 TO 1000: NEXT K
350 A=&HFF: GOSUB 500
360 PORT=PORT+4
370 OUT PORT+3,&H80
380 A=0: GOSUB 500
385 FOR K=0 TO 1000: NEXT K
390 A=&HFF: GOSUB 500
400 GOTO 320
500 FOR I=0 TO 2
510 OUT PORT+I,A
520 NEXT I
530 RETURN
```

2. PASCAL version

```
Program diagnostic(input, output);
uses
        Crt;
var
        a, i, test : integer;
procedure subtest;
begin
        for i := 0 to 2 do
                port[test+i] := a;
end;
begin
        { 8255 I/O Card Testing Program }
        clrscr;
        gotoxy(10, 10);
        writeln('8255 I/O CARD TESTING');
        gotoxy(10, 12);
        writeln('TWO 8255 PORT A,B,C OUTPUT SQUARE WAVE');
        gotoxy(10, 14);
        writeln('8253 COUNTER 0 DIVIDE BY 2');
        gotoxy(10, 16);
        writeln('8253 COUNTER 1 DIVIDE BY 50');
        gotoxy(10, 18);
        writeln('8253 COUNTER 2 DIVIDE BY 100');
        { 8253 Testing }
        test := $300;
        port[test+11] := $36;
        port[test+11] := $76;
        port[test+11] := $B6;
        port[test+ 8] := $02; port[test+ 8] := $0;
        port[test+ 9] := $32; port[test+ 9] := $0;
        port[test+10] := $64; port[test+10] := $0;
        repeat
                test := $300;
                port[test+3] := $80;
                a := 0; subtest;
                for i := 0 to 1000 do;
                a := $ff; subtest;
                test := test + 4;
                port[test+3] := $80;
                a := 0; subtest;
                for i := 0 to 1000 do;
                a := $ff; subtest
```

```
        until keypressed;
end.
```

3. C version

```
#include <stdio.h>
#include <conio.h>

int test,i,a;
void subtest()
{
        for(i=0;i<=2;i++) outportb(test+i,a);
}
main()
{
        clrscr();
        gotoxy(10,10);
        puts("8255 I/O CARD TESTING");
        gotoxy(10,12);
        puts("TWO 8255 PORT A,B,C OUTPUT SQUARE WAVE");
        gotoxy(10,14);
        puts("8253 COUNTER 0 DIVIDE BY 2");
        gotoxy(10,16);
        puts("8253 COUNTER 1 DIVIDE BY 50");
        gotoxy(10,18);
        puts("8253 COUNTER 2 DIVIDE BY 100");

        test = 0x300;
        outportb(test+11,0x36);
        outportb(test+11,0x76);
        outportb(test+11,0xb6);
        outportb(test+ 8,0x02);
        outportb(test+ 8,0x00);
        outportb(test+ 9,0x32);
        outportb(test+ 9,0x00);
        outportb(test+10,0x64);
        outportb(test+10,0x00);

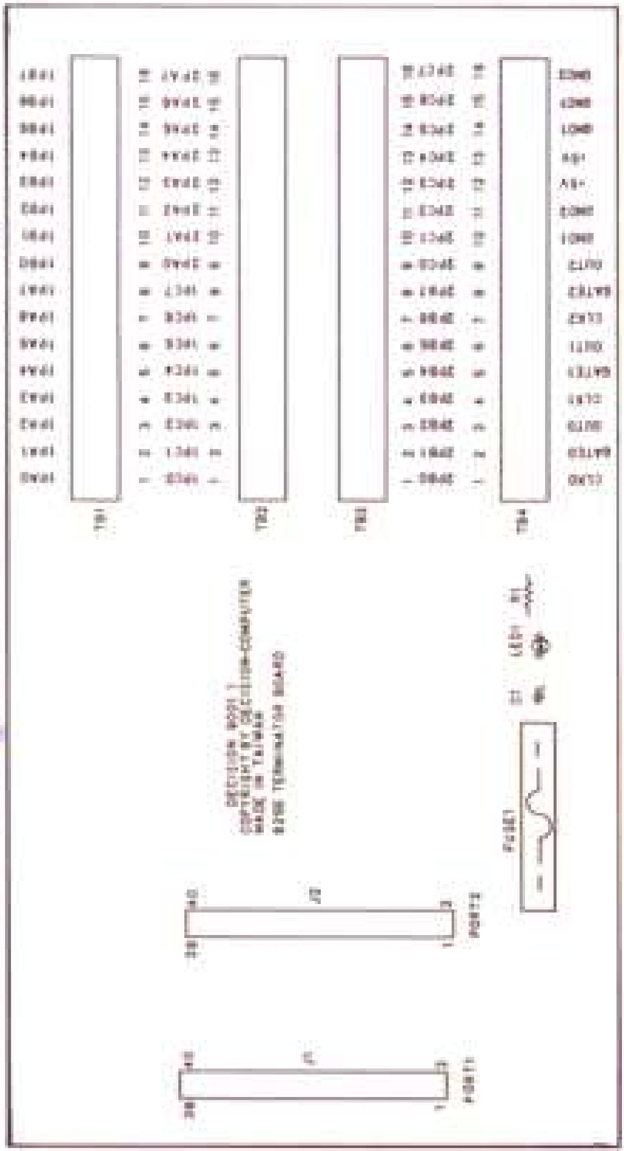
        do {
                test = 0x300;
                outportb(test+3,0x80);
                a = 0;
                subtest();
                for(i=0;i<=1000;i++);
                a = 0xff;
```

```
                subtest();
        } while(!kbhit());
}
```

APPENDIX A

TERMINATOR BOARD

The 8255terminator board provides expansion signal connection for convenience purpose. When power control on the normal condition, the LED will light. The layout of 8255terminator board is shown in the follows.



The signal assignment is shown in the follows.

1. TB1

PORT 1	PA0
PORT 1	PA1
PORT 1	PA2
PORT 1	PA3
PORT 1	PA4
PORT 1	PA5
PORT 1	PA6
PORT 1	PA7
PORT 1	PB0
PORT 1	PB1
PORT 1	PB2
PORT 1	PB3
PORT 1	PB4
PORT 1	PB5
PORT 1	PB7

2. TB2

PORT 1	PC0
PORT 1	PC1
PORT 1	PC2
PORT 1	PC3
PORT 1	PC4
PORT 1	PC5
PORT 1	PC6
PORT 1	PC7
PORT 2	PA0
PORT 2	PA1
PORT 2	PA2
PORT 2	PA3
PORT 2	PA4
PORT 2	PA5
PORT 2	PA7

3. TB3

PORT 2	PB0
PORT 2	PB1
PORT 2	PB2
PORT 2	PB3
PORT 2	PB4
PORT 2	PB5
PORT 2	PB6
PORT 2	PB7
PORT 2	PC0
PORT 2	PC1
PORT 2	PC2
PORT 2	PC3
PORT 2	PC4
PORT 2	PC5
PORT 2	PC6
PORT 2	PC7

4. TB4

CLK0
GATE0
OUT0
CLK1
GATE1
OUT1
CLK2
GATE2
OUT2
GND1
GND2
+5V
-5V
GND1
GND1
GND2